



**Tetra Tech EM Inc.**

135 Main Street, Suite 1800 ♦ San Francisco, CA 94105 ♦ (415) 543-4880 ♦ FAX (415) 543-5480

June 19, 2003

Mr. G. Patrick Brooks, R.G.  
Remedial Project Manager  
Naval Facilities Engineering Command  
Southwest Division  
1230 Columbia Street, Suite 1100  
San Diego, CA 92101

**Subject: Quarterly Status Report – Groundwater Elevation Maps  
Parcel C Treatability Study Support  
Hunters Point Shipyard, San Francisco, California  
Contract Number N68711-00-D-0005, Delivery Order 0013**

Dear Mr. Brooks:

This letter presents the status of activities conducted by Tetra Tech EM Inc. (Tetra Tech) for the Ferox<sup>sm</sup> zero-valent iron injection technology demonstration at Parcel C, Remedial Unit C4, of Hunters Point Shipyard. This work is being conducted under the above-referenced delivery order from the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command, Southwest Division, under the Indefinite Quantity Contract for Architectural-Engineering Services to Provide CERCLA/RCRA/UST Studies. The demonstration project is being conducted in association with and is partially funded by the Navy's Alternative Restoration Technology Team, Naval Facilities Engineering Service Center (NFESC).

During the first quarter of 2003, Tetra Tech completed three rounds of post-injection groundwater sampling. The three post-injection sampling events were completed during the weeks beginning January 6, February 3, and March 17, 2003. During the previous quarter, Tetra Tech completed one round of groundwater sampling to document baseline conditions before zero-valent iron injection. Groundwater levels were measured prior to each sampling event to help determine groundwater gradients in support of the technology demonstration.

This status report specifically serves to transmit groundwater elevation maps based on measurements recorded during all four rounds of sampling. The groundwater elevation maps are provided in Enclosure 1.

DS.A013.10835

Mr. G. Patrick Brooks  
June 19, 2003  
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If you have any questions or comments, please contact me at (215) 656-8720 or Doug Bielskis at (415) 222-8242.

Sincerely,



John McCall, P.E.  
Project Manager

Enclosure 1

cc: Dr. D.B. Chan, ARTT  
Mr. Keith Forman, Southwest Division  
Mr. Dave DeMars, Southwest Division  
Ms. Diane Silva (Admin. Record), Southwest Division  
Mr. Doug Bielskis, Tetra Tech  
AECRU File

DS.A013.10835



TETRA TECH EM INC.

## TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N68711-00-D-0005

Document Control No. DS.A013.10835

TO: Mr. Ron Fuller, Code 02R1.RF  
Contracting Officer  
Naval Facilities Engineering Command  
Southwest Division  
1230 Columbia Street, Suite 1100  
San Diego, CA 92101-8517

DATE: 6/20/03  
DO: 013  
LOCATION:  
Hunters Point Shipyard, San Francisco  
California

FROM:   
Michael Wanta, Contract Manager

DOCUMENT TITLE AND DATE:

**Quarterly Status Report – Groundwater Elevation Maps, Parcel C Treatability Study Support,**  
**June 19, 2003**

TYPE: ☐ Contractual Deliverable ☒ Technical Deliverable (DS) ☐ Other (TC)

VERSION: \_\_\_\_\_ REVISION #: \_\_\_\_\_  
(e.g., Draft, Draft Final, Final) Rev # or NA

ADMIN RECORD: Yes ☒ No ☐ CATEGORY: Confidential ☐

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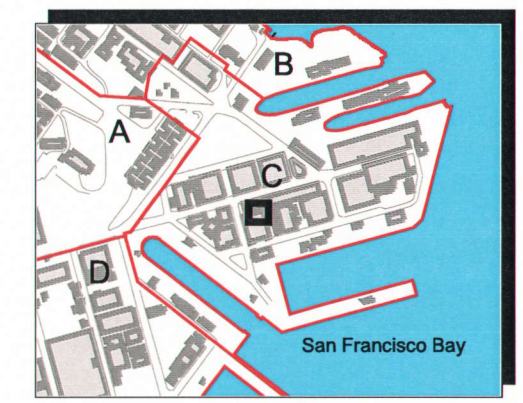
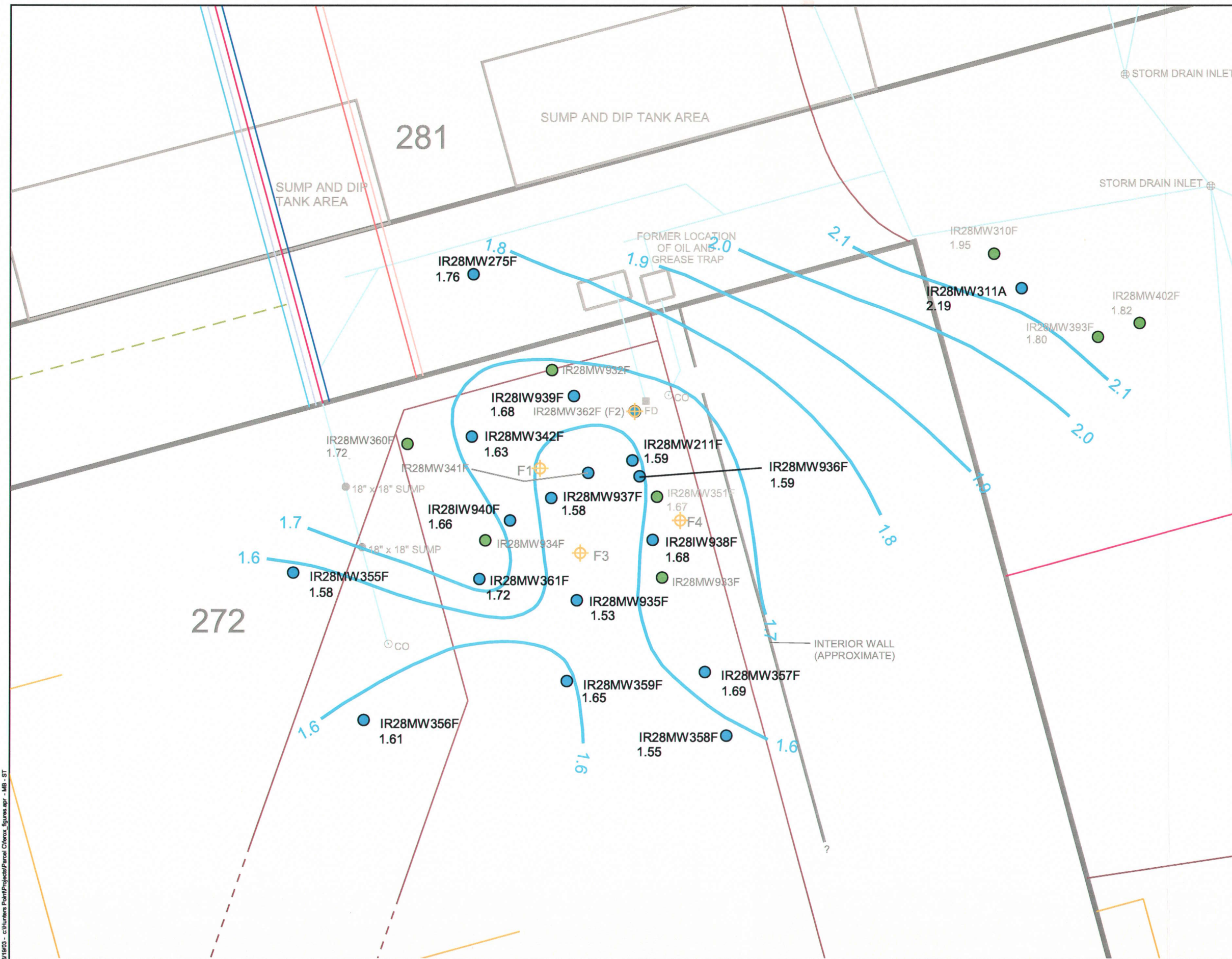
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**ENCLOSURE 1**  
**GROUNDWATER ELEVATION MAPS**

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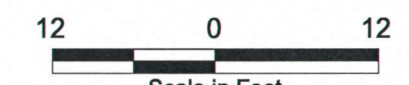


Location Map

- A-aquifer Monitoring Well
- Bedrock Water-bearing Zone Monitoring Well
- IR28MW311A 2.19 Groundwater Elevation, Feet Above Mean Sea Level
- IR28MW3515F 1.67 Groundwater Elevation Data not Measured or not Used to Prepare Contours
- ⊕ Injection Well
- ⋈ Groundwater Elevation Contour, Feet Above Mean Sea Level
- ⊙ CO Clean Out
- ⊕ Storm Drain Inlet
- FD Floor Drain
- 272 Building/Building Number
- Storm Sewer
- Air not Verified
- Electrical Overhead not Verified
- Electrical Underground not Verified
- Fresh Water not Verified
- Gas not Verified
- Saltwater not Verified
- Sanitary Sewer not Verified
- Steam Condensate not Verified
- Steam not Verified
- Storm Drain

Notes

1. Groundwater Level Measurements Performed December 3, 2002.
  2. Utility Locations Taken From U.S. Navy Drawing Quad. D-2, August 3, 1955. Tetra Tech EM, Inc. Hunters Point Shipyard Index Drawing No. 0712.
  3. Utilities Dashed Where Inferred
- ? Not Verified



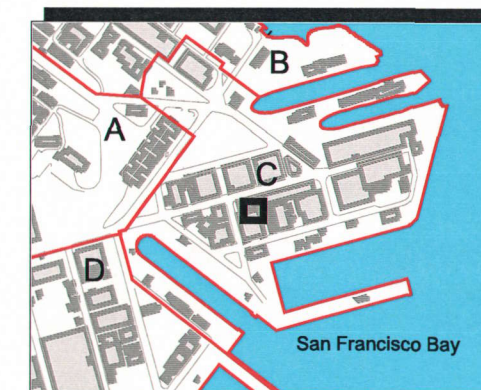
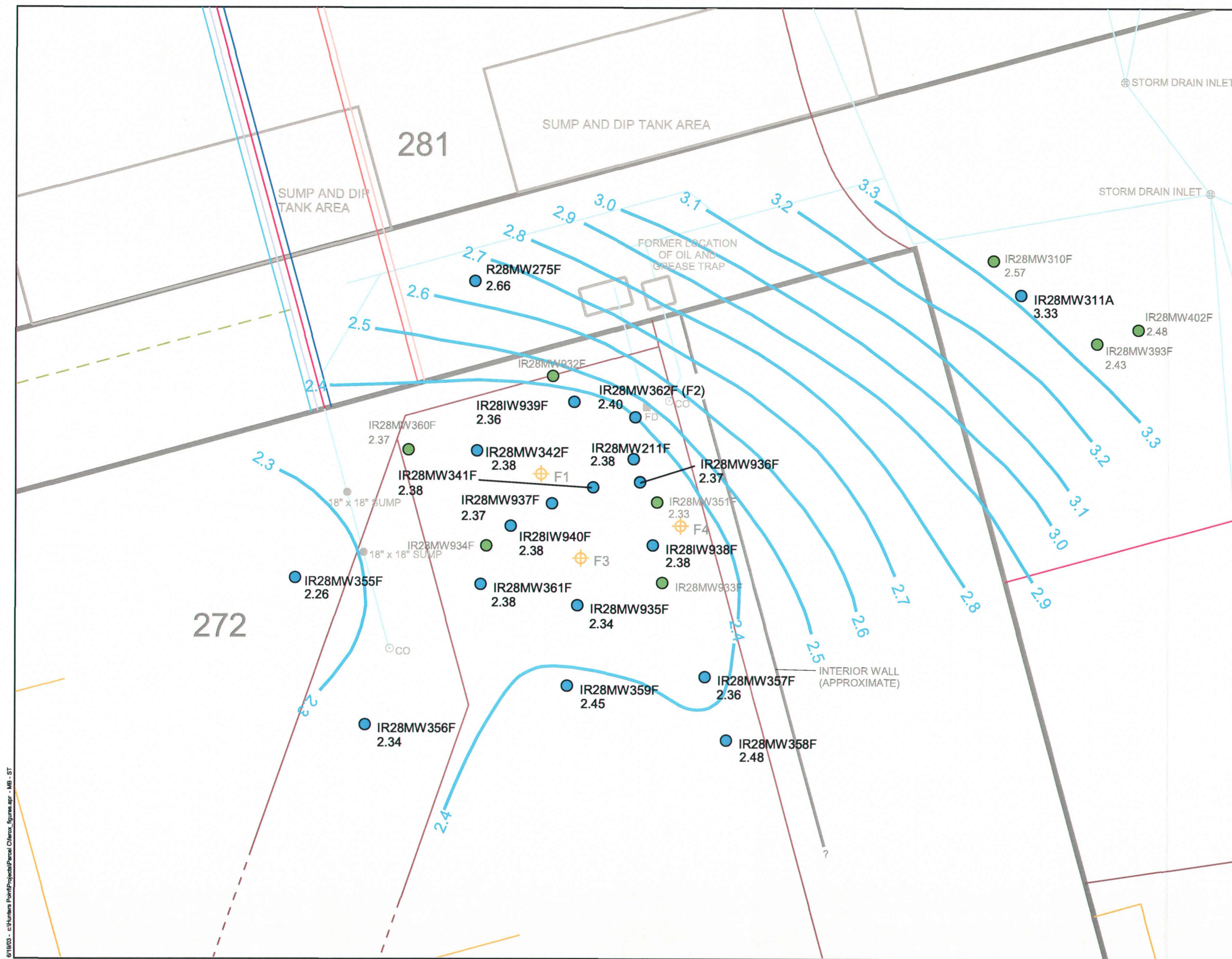
Scale in Feet  
Tetra Tech EM Inc.

Hunters Point Shipyard, San Francisco, California  
U.S. Navy Southwest Division, NAVFAC, San Diego

**FIGURE 1**  
**BASELINE GROUNDWATER ELEVATIONS**

Ferox<sup>SM</sup> Injection Technology Demonstration  
Quarterly Status Report - Groundwater Elevation Maps



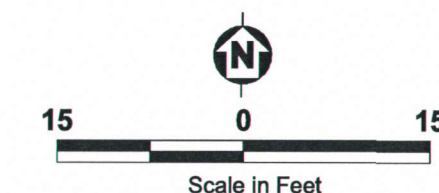


Location Map

- A-aquifer Monitoring Well
- Bedrock Water-bearing Zone Monitoring Well
- IR28MW311A 3.33 Groundwater Elevation, Feet Above Mean Sea Level
- IR28MW3515F 1.67 Groundwater Elevation Data not Measured or not Used to Prepare Contours
- ⊕ Injection Well
- ~ Groundwater Elevation Contour, Feet Above Mean Sea Level
- CO Clean Out
- ⊕ Storm Drain Inlet
- FD Floor Drain
- 272 Building/Building Number
- Storm Sewer
- Air not Verified
- Electrical Overhead not Verified
- Electrical Underground not Verified
- Fresh Water not Verified
- Gas not Verified
- Saltwater not Verified
- Sanitary Sewer not Verified
- Steam Condensate not Verified
- Steam not Verified
- Storm Drain

Notes

- Groundwater Level Measurements Performed January 6, 2003
- Utility Locations Taken from U.S. Navy Drawing Quad. D-2, August 3, 1955. Tetra Tech EM, Inc. Hunters Point Shipyard Index Drawing No. 0712.
- Utilities Dashed Where Inferred
- ? Not Verified



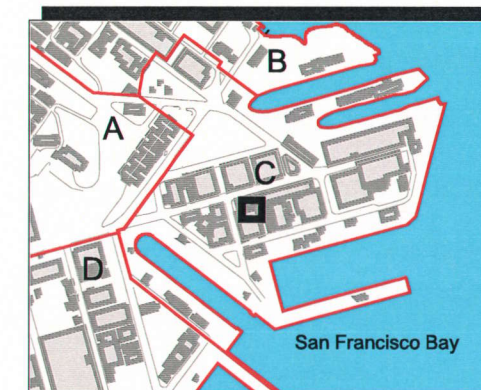
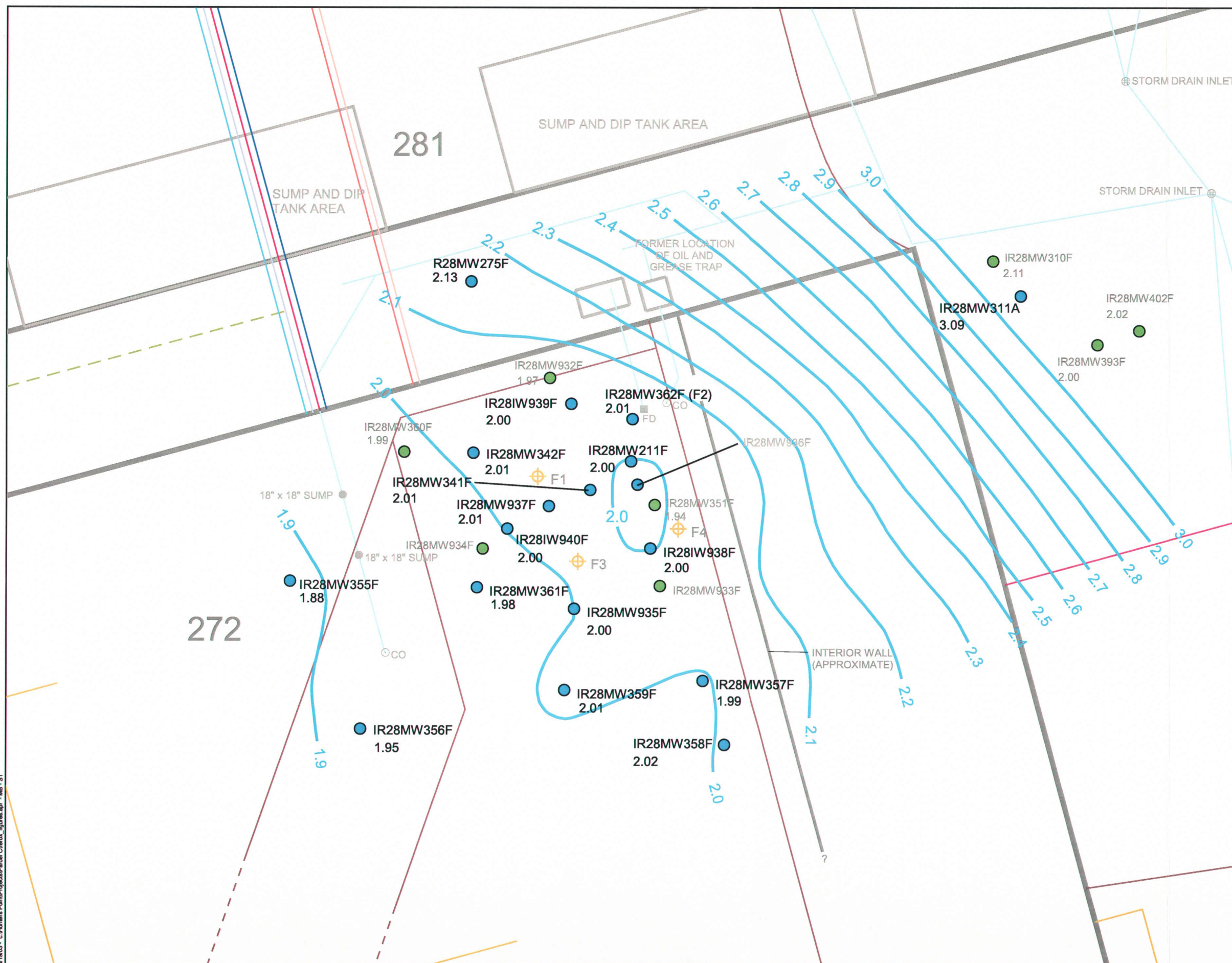
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U.S. Navy Southwest Division, NAVFAC, San Diego

**FIGURE 2  
POST-INJECTION ROUND 1  
GROUNDWATER ELEVATIONS**

Ferox<sup>SM</sup> Injection Technology Demonstration  
Quarterly Status Report - Groundwater Elevation Maps



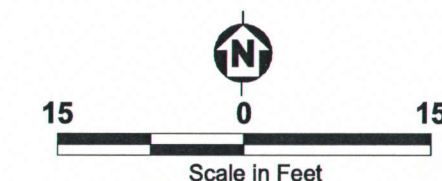


Location Map

- A-aquifer Monitoring Well
- Bedrock Water-bearing Zone Monitoring Well
- IR28MW311A 3.09 Groundwater Elevation, Feet Above Mean Sea Level
- IR28MW3515F 1.67 Groundwater Elevation Data not Measured or not Used to Prepare Contours
- ⊕ Injection Well
- Groundwater Elevation Contour, Feet Above Mean Sea Level
- CO Clean Out
- ⊕ Storm Drain Inlet
- FD Floor Drain
- 272 Building/Building Number
- Storm Sewer
- Air not Verified
- Electrical Overhead not Verified
- Electrical Underground not Verified
- Fresh Water not Verified
- Gas not Verified
- Saltwater not Verified
- Sanitary Sewer not Verified
- Steam Condensate not Verified
- Steam not Verified
- Storm Drain

Notes

1. Groundwater Level Measurements Performed February 4, 2003
2. Utility Locations Taken from U.S. Navy Drawing Quad. D-2, August 3, 1955. Tetra Tech EM, Inc. Hunters Point Shipyard Index Drawing No. 0712.
3. Utilities Dashed Where Inferred
- ? Not Verified



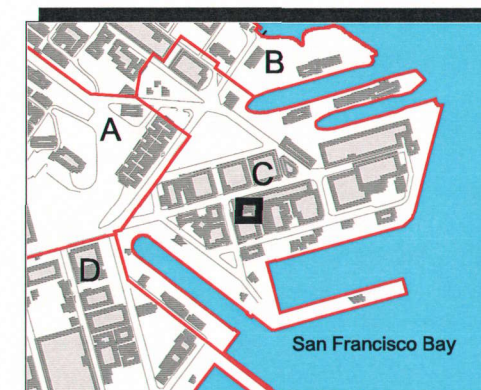
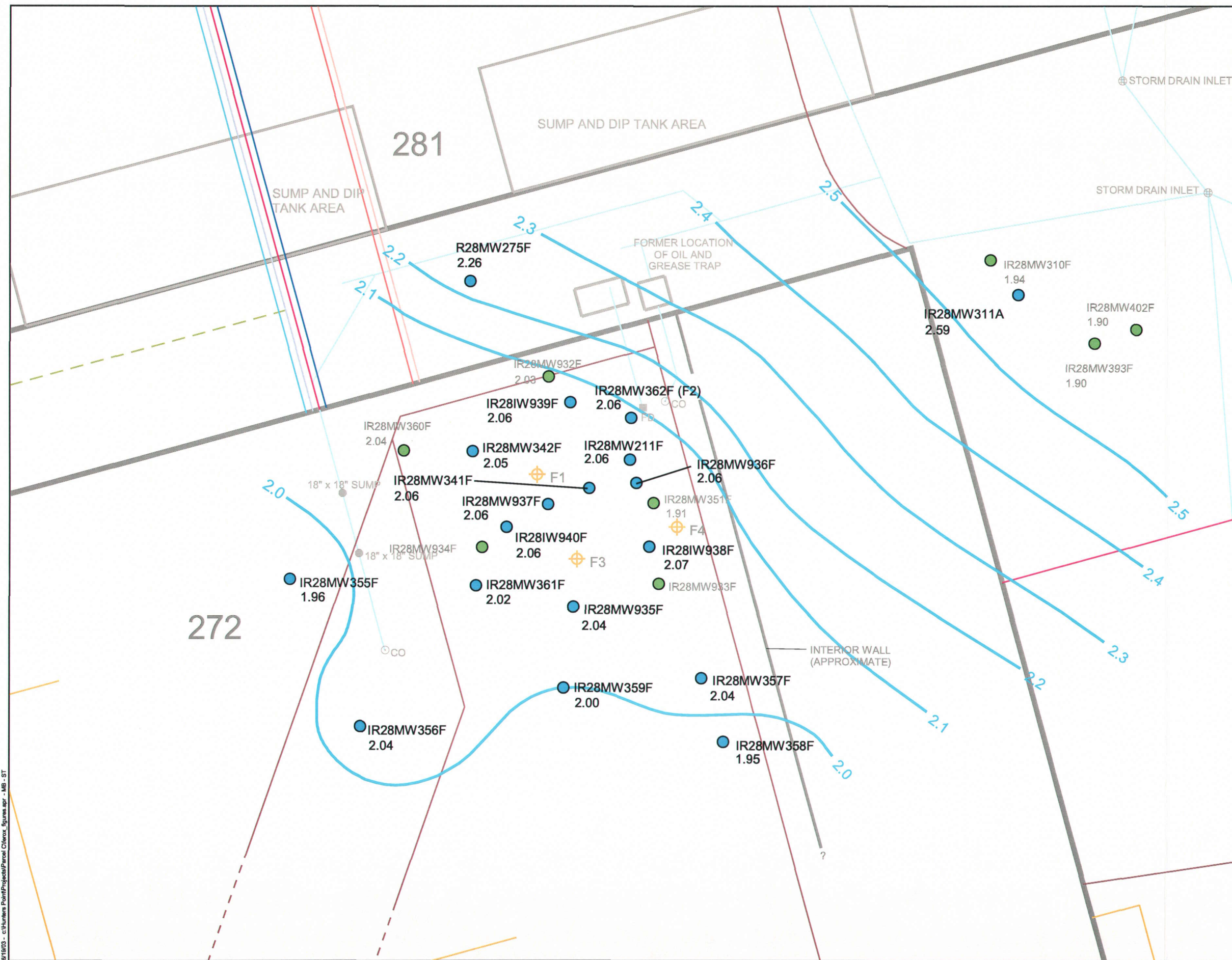
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U.S. Navy Southwest Division, NAVFAC, San Diego

**FIGURE 3  
POST-INJECTION ROUND 2  
GROUNDWATER ELEVATIONS**

Ferox<sup>SM</sup> Injection Technology Demonstration  
Quarterly Status Report - Groundwater Elevation Maps



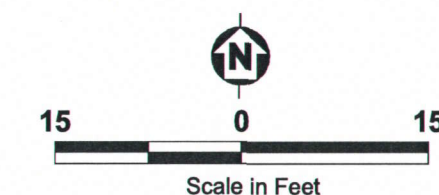


Location Map

- A-aquifer Monitoring Well
- Bedrock Water-bearing Zone Monitoring Well
- IR28MW311A 2.59 Groundwater Elevation, Feet Above Mean Sea Level
- IR28MW3515F 1.67 Groundwater Elevation Data not Measured or not Used to Prepare Contours
- ⊕ Injection Well
- Groundwater Elevation Contour, Feet Above Mean Sea Level
- CO Clean Out
- ⊕ Storm Drain Inlet
- FD Floor Drain
- 272 Building/Building Number
- Storm Sewer
- Air not Verified
- Electrical Overhead not Verified
- Electrical Underground not Verified
- Fresh Water not Verified
- Gas not Verified
- Saltwater not Verified
- Sanitary Sewer not Verified
- Steam Condensate not Verified
- Steam not Verified
- Storm Drain

Notes

1. Groundwater level measurements performed March 18, 2003.
2. Utility Locations Taken from U.S. Navy Drawing Quad. D-2, August 3, 1955. Tetra Tech EM, Inc. Hunters Point Shipyard Index Drawing No. 0712.
3. Utilities Dashed Where Inferred
- ? Not Verified



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**FIGURE 4  
POST-INJECTION ROUND 3  
GROUNDWATER ELEVATIONS**

Ferox<sup>SM</sup> Injection Technology Demonstration  
Quarterly Status Report - Groundwater Elevation Maps